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10/057,105	01/25/2002	Jorg-Reinhardt Kropp	GR01P4989	1402

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EXAMINER	
PAYNE, DAVID C	
ART UNIT	**PAPER NUMBER**
2633	

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17

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/057,105	KROPP, JORG-REINHARDT	
	Examiner	Art Unit	
	David C. Payne	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24 and 26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☒ Claim(s) *26* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 10 November 2003 have been fully considered but they are not persuasive.

2. First, regarding applicant' s assertion (Kropp Amendment 10 November 2003, p.11)

" *Consequently, in Epworth the length of the respective optical signals generated by the light transmitters is greater than a length of the corresponding bit, in contrast to the present invention as recited in the claims.*"

The applicant' s conclusion is based only on the chirped pulse emitted from the transmitter and not on the pulse at the output of the system (34), which should be the relevant point of observance. In fact the applicant' conclusion is in direct contradiction to what Epworth has claimed. Noting the reciprocal effects of light as it travels thru a dispersive transmission path (Epworth 12 of Figure 1), Epworth launches chirped pulses (20 of Figure 2) into a dispersive fiber (11) to generate a **shortened** pulse (22 of Figure 2). Epworth concludes (p. 2) " *Fig. 2 is a diagram illustrating the reciprocal process in which a chirped pulse of extended duration is compressed into a shorter duration pulse by*

its passage through the dispersive transmission path..."

3. Regarding applicant' s assertion (Kropp Amendment 10 November 2003, p.13) that Hayee does not suggest that RZ is superior to NRZ modulation. However, as the applicant correctly notes, Hayes disclosed " For <= 8 channels, RZ is almost always more optimal." The examiner contends that is therefore, a proper motivation to combine Hayee with the teaching of Epworth, which does illustrate an embodiment (Fig. 3) with four transmitters. In the absence of any claim as to the number of transmitters exceeding 8 in the instant application, the motivation for combining the prior art is deemed proper.

4. Finally, after a rereading of the applicant' specification, the applicant appears to have an embodiment that functions as does Epworth to stagger the combined pulses of a plurality of transmitters thereby achieving high data rates by elimination of data dependent jitter (instant application, p.8, p.9/ lines 12 - 22) and a different embodiment, which combines the pulses of a plurality of transmitters into an overlapping pulse (instant application, p.9 lines/24-26, p. 10 lines 1-2). It is not evident as to which embodiment the applicant refers to in claims 1 and 16. That is to say, it is not evident if the applicant feels both embodiments have the affect of generating " optical signals having a length not greater than a length of the corresponding respective bits of the digital electrical

signal sequence." Nevertheless, new prior art (Dworkin US 3,727,061) does disclose the method of overlapping pulses from a plurality of transmitters. It appears that Epworth and Dworkin both teach the same structure and method as claimed by the applicant. Thus, the examiner can find no additional teaching in applicant' s disclosure that differentiates above the prior art.

Allowable Subject Matter

5. Claim 26 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1, 4, 7, 8, 10 – 14, 16, 19, and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Epworth UK Patent Application GB 2 269 953 A (Epworth) in view of (Hayee) NRZ vs. RZ in 10-40 Gbit/s dispersion-managed WDM transmission systems , M.I. Hayee, A.E. Willner, Department of Electrical Engineering-Systems, USC, Los Angeles, CA; *Optical Fiber Communication Conference and Exhibit*, 1998. OFC '98.,Technical Digest, 22-27 Feb. 1998 Page(s): 407

Re claims 1, 8, 10, 11, 16, 19, 23, 24

Epworth disclosed an optical transmitter/method for generating a digital optical signal sequence, comprising:

a plurality of independently drivable light transmitters (*Fig. 3, #33*), said light transmitters generating respective optical signals for respective bits of a digital electrical signal sequence, said respective optical signals being combined and superposed into an optical signal path (*Fig. 3, #35*); and

a control device (*Fig. 3, #31*), distributing the bits between said light transmitters (*see page 2, lines 1*

– *10)* Epworth does not disclose said bit being distributed such that before a HIGH state output, a respective light transmitter is in a LOW state. Hayee disclosed a return-to-zero modulation transmission over fiber. The LOW state/ HIGH state transition transmitter characteristic as claimed is equivalent to a RZ modulation format. It would have been obvious to one ordinary skill in the art at the time of invention to use RZ modulation with the Epworth system since RZ modulation is better than NRZ in combating self-phase modulation (SPM) in WDM systems as taught in Hayee (see p.407 last column).

Epworth does not disclose, " said respective optical signals having a length not greater than an length of the corresponding respective bits of the digital electrical signal sequence." However, Epworth does disclose a similar structure of recombining staggered pulses from a plurality of transmitters, which is the same as applicant. Furthermore, applicant does not appear to disclose any particular pulse modification above Epworth. Therefore, it would have been obvious to one of ordinary skill in the art the time of invention to conclude using multiple transmitters to generate a sequence of pulses will necessarily produce a series of optical pulses that are shorter than their electrical counterpart since there is no associated dependencies between pulses that are normally an artifact of using a signal transmitter and thereby stretch pulse trains and reduce effective bandwidth.

Re claim 4,

Epworth disclosed distributor " control device" distributes between said light transmitters a number of bits of the digital electrical signal sequence which corresponds to a number of said light transmitters, and said light transmitters simultaneously generate said respective optical signals (*see page 2, 2nd paragraph*).

Re claim 7, 22 Epworth does disclose staggering the bits in each optical path.

Re claim 12, Epworth disclosed a coupler (*Fig. 3, #34*) for coupler into a single waveguide.

Re claims 13 and 14, Epworth disclosed a four (even) number of transmitters (*Fig. 3, #33*).

8. Claims 2, 3, 5, 6, 17, 18, 20, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Epworth UK Patent Application GB 2 269 953 A (Epworth) and (Hayee as noted above) as applied to claims 1 and 16 above, and further in view of Das et al. US 5,703,708 (Das).

Re claims 2, 3, 5, 6, 17, 18, 20, and 21

Epworth/Hayee does not disclose that the transmitters generate said respective optical signals in a temporally staggered manner. Das disclosed merging optical pulse streams which have been delayed (fixed temporally staggered) by 1 bit period for each optical delay line (*see Das, col./lines: 2/5-20*). It

would have been obvious to one of ordinary skill in the art at the time of invention to incorporate the delay components (*VL1, VL2, VL3*) respectively along the optical paths in Epworth to obtain the claimed invention. First, the structure of Das (*Fig. 2*) is very similar to the structure of Epworth (*Fig. 3*) in that the Das modulators (*MS1 – MS4*) function as the Epworth Drivers (*#32*). Second, whereas the Epworth bits partially overlay, it leads one of ordinary skill in the art to consider adding delay to each optical line to produce a succession of non-overlapping bits.

9. Claims 9 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Epworth UK Patent Application GB 2 269 953 A (Epworth) and (Hayee as noted above) as applied to claim 1 above, and further in view of view of Frankel US 6,096,496 (Frankel).

Epworth/Hayee do not disclose light transmitters that are disposed a short distance apart on a semiconductor chip in the form of a VCSEL array. Frankel disclosed a VCSEL/ EEL array, which is inherently a configuration of closely space lasers (*see Frankel col./lines: 28/5-30*). It would have been obvious to one of ordinary skill in the art at the time of invention to fashion the Epworth lasers as did Frankel since the high density offered by such arrays allows greater integration and smaller packaging of systems.

10. Claims 1 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dworkin US 3,727,061 (Dworkin) in view of (Hayee) NRZ vs. RZ in 10-40 Gbit/s dispersion-managed WDM transmission systems , M.I. Hayee, A.E. Willner, Department of Electrical Engineering-Systems, USC, Los Angeles, CA; *Optical Fiber Communication Conference and Exhibit*, 1998. OFC '98.,Technical Digest, 22-27 Feb. 1998 Page(s): 407

Re claims 1 and 16

Dworkin disclosed an optical transmitter/method for generating a digital optical signal sequence, comprising:

a plurality of independently drivable light transmitters (*Fig. 1, #20*), said light transmitters generating respective optical signals for respective bits of a digital electrical signal sequence, said respective optical signals being combined and superposed into an optical signal path (*Fig. 1, #23*); and

a control device (*Fig. 3, #22*), distributing the bits between said light transmitters (*see page 4, lines 10-25*) Dworkin does not disclose said bit being distributed such that before a HIGH state output, a respective light transmitter is in a LOW state. Hayee disclosed a return-to-zero modulation transmission over fiber. The LOW state/ HIGH state transition transmitter characteristic as claimed is equivalent to a RZ modulation format. It would have been obvious to one ordinary skill in the art at the time of invention to use RZ modulation with the Dworkin system since RZ modulation is better than

NRZ in combating self-phase modulation (SPM) in WDM systems as taught in Hayee (see p.407 last column).

Dworkin does not disclose, " said respective optical signals having a length not greater than an length of the corresponding respective bits of the digital electrical signal sequence." However, Dworkin does disclose a similar structure of recombining overlapping pulses from a plurality of transmitters, which is the same as applicant. Furthermore, applicant does not appear to disclose any particular pulse modification above Dworkin. Therefore, it would have been obvious to one of ordinary skill in the art the time of invention to conclude using multiple transmitters to generate a sequence of pulses will necessarily produce a series of optical pulses that are shorter than their electrical counterpart since there is no associated dependencies between pulses that are normally an artifact of using a signal transmitter and thereby stretch pulse trains and reduce effective bandwidth.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David C. Payne whose telephone number is (703) 306-0004. The examiner can normally be reached on M-F, 7a-4p.

If attempts to reach the examiner by telephone are unsuccessful, the examiner' s supervisor, Jason Chan can be reached on (703) 305-4729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dcp

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